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The Miracle Woman

By Rebecca Skloot

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*When Henrietta Lacks was diagnosed with cancer in 1951, doctors took her cells and grew them in test tubes. Those cells led to breakthroughs in everything from Parkinson's to polio. But today, Henrietta is all but forgotten. In an excerpt from her book, *The Immortal Life of Henrietta Lacks*, Rebecca Skloot tells her story.*

In 1951, at the age of 30, Henrietta Lacks, the descendant of freed slaves, was diagnosed with cervical cancer—a strangely aggressive type, unlike any her doctor had ever seen. He took a small tissue sample without her knowledge or consent. A scientist put that sample into a test tube, and, though Henrietta died eight months later, her cells—known worldwide as HeLa—are still alive today. They became the first immortal human cell line ever grown in culture and one of the most important tools in medicine: Research on HeLa was vital to the development of the polio vaccine, as well as drugs for treating herpes, leukemia, influenza, hemophilia, and Parkinson's disease; it helped uncover the secrets of cancer and the effects of the atom bomb, and led to important advances like cloning, in vitro fertilization, and gene mapping. Since 2001 alone, five Nobel Prizes have been awarded for research involving HeLa cells.

There's no way of knowing exactly how many of Henrietta's cells are alive today. One scientist estimates that if you could pile all the HeLa cells ever grown onto a scale, they'd weigh more than 50 million metric tons—the equivalent of at least 100 Empire State Buildings.

Today, nearly 60 years after Henrietta's death, her body lies in an unmarked grave in Clover, Virginia. But her cells are still among the most widely used in labs worldwide—bought and sold by the billions. Though those cells have done wonders for science, Henrietta—whose legacy involves the birth of bioethics and the grim history of experimentation on African-Americans—is all but forgotten.

Start reading her story

On January 29, 1951, David Lacks sat behind the wheel of his old Buick, watching the rain fall. He was parked under a towering oak tree outside Johns Hopkins Hospital with three of his children—two still in diapers—waiting for their mother, Henrietta. A few minutes earlier she'd jumped out of the car, pulled her jacket over her head, and scurried into the hospital, past the "colored" bathroom, the only one she was allowed to use. In the next

building, under an elegant domed copper roof, a ten-and-a-half-foot marble statue of Jesus stood, arms spread wide, holding court over what was once the main entrance of Hopkins. No one in Henrietta's family ever saw a Hopkins doctor without visiting the Jesus statue, laying flowers at his feet, saying a prayer, and rubbing his big toe for good luck. But that day Henrietta didn't stop.

She went straight to the waiting room of the gynecology clinic, a wide-open space, empty but for rows of long, straight-backed benches that looked like church pews.

"I got a knot on my womb," she told the receptionist. "The doctor need to have a look."

For more than a year Henrietta had been telling her closest girlfriends that something didn't feel right. One night after dinner, she sat on her bed with her cousins Margaret and Sadie and told them, "I got a knot inside me."

"A what?" Sadie asked.

"A knot," she said. "It hurt somethin' awful—when that man want to get with me, Sweet Jesus aren't them but some pains."

When sex first started hurting, she thought it had something to do with baby Deborah, who she'd just given birth to a few weeks earlier, or the bad blood David sometimes brought home after nights with other women—the kind doctors treated with shots of penicillin and heavy metals.

About a week after telling her cousins she thought something was wrong, at the age of 29, Henrietta turned up pregnant with Joe, her fifth child. Sadie and Margaret told Henrietta that the pain probably had something to do with a baby after all. But Henrietta still said no.

"It was there before the baby," she told them. "It's somethin' else."

They all stopped talking about the knot, and no one told Henrietta's husband anything about it. Then, four and a half months after baby Joseph was born, Henrietta went to the bathroom and found blood spotting her underwear when it wasn't her time of the month.

She filled her bathtub, lowered herself into the warm water, and slowly spread her legs. With the door closed to her children, husband, and cousins, Henrietta slid a finger inside herself and rubbed it across her cervix until she found what she somehow knew she'd find: a hard lump, deep inside, as though someone had lodged a marble the size of her pinkie tip just to the left of the opening to her womb.

Henrietta climbed out of the bathtub, dried herself off, and dressed. Then she told her husband, "You better take me to the doctor. I'm bleeding and it ain't my time."

Her local doctor took one look inside her, saw the lump, and figured it was a sore from syphilis. But the lump tested negative for syphilis, so he told Henrietta she'd better go to the Johns Hopkins gynecology clinic.

The public wards at Hopkins were filled with patients, most of them black and unable to pay their medical bills. David drove Henrietta nearly 20 miles to get there, not because they preferred it, but because it was the only major hospital for miles that treated black patients. This was the era of Jim Crow—when black people showed up at white-only hospitals, the staff was likely to send them away, even if it meant they might die in the parking lot.

When the nurse called Henrietta from the waiting room, she led her through a single door to a colored-only exam room—one in a long row of rooms divided by clear glass walls that let nurses see from one to the next. Henrietta undressed, wrapped herself in a starched white hospital gown, and lay down on a wooden exam table, waiting for Howard Jones, the gynecologist on duty. When Jones walked into the room, Henrietta told him about the lump. Before examining her, he flipped through her chart:

Breathing difficult since childhood due to recurrent throat infections and deviated septum in patient's nose. Physician recommended surgical repair. Patient declined. Patient had one toothache for nearly five years. Only anxiety is oldest daughter who is epileptic and can't talk. Happy household. Well nourished, cooperative. Unexplained vaginal bleeding and blood in urine during last two pregnancies; physician recommended sickle cell test. Patient declined. Been with husband since age 14 and has no liking for sexual intercourse. Patient has asymptomatic neurosyphilis but canceled syphilis treatments, said she felt fine. Two months prior to current visit, after delivery of fifth child, patient had significant blood in urine. Tests showed areas of increased cellular activity in the cervix. Physician recommended diagnostics and referred to specialist for ruling out infection or cancer. Patient canceled appointment.

It was no surprise that she hadn't come back all those times for follow-up. For Henrietta, walking into Hopkins was like entering a foreign country where she didn't speak the language. She knew about harvesting tobacco and butchering a pig, but she'd never heard the words *cervix* or *biopsy*. She didn't read or write much, and she hadn't studied science in school. She, like most black patients, only went to Hopkins when she thought she had no choice.

Henrietta lay back on the table, feet pressed hard in stirrups as she stared at the ceiling. And sure enough, Jones found a lump exactly where she'd said he would. If her cervix was a clock's face, the lump was at 4 o'clock. He'd seen easily a thousand cervical cancer lesions, but never anything like this: shiny and purple (like "grape Jello," he wrote later), and so delicate it bled at the slightest touch. Jones cut a small sample and sent it to the pathology lab down the hall for a diagnosis. Then he told Henrietta to go home.

Soon after, Howard Jones dictated notes about Henrietta and her diagnosis: "Her history is interesting in that she had a term delivery here at this hospital, September 19, 1950," he said. "No note is made in the history at that time or at the six weeks' return visit that there is any abnormality of the cervix."

Yet here she was, three months later, with a full-fledged tumor. Either her doctors had missed it during her last exams—which seemed impossible—or it had grown at a terrifying rate.

Henrietta Lacks was born Loretta Pleasant in Roanoke, Virginia, on August 1, 1920. No one knows how she became Henrietta. A midwife named Fannie delivered her in a small shack on a dead-end road overlooking a train depot, where hundreds of freight cars came and went each day. Henrietta shared that house with her parents and eight older siblings until 1924, when her mother, Eliza Lacks Pleasant, died giving birth to her tenth child.

Henrietta's father, Johnny Pleasant, was a squat man who hobbled around on a cane he often hit people with. Johnny didn't have the patience for raising children, so when Eliza died, he took them all back to Clover, Virginia, where his family still farmed the tobacco fields their ancestors had worked as slaves. No one in Clover could take

all ten children, so relatives divided them up—one with this cousin, one with that aunt. Henrietta ended up with her grandfather, Tommy Lacks.

Tommy lived in what everyone called the home-house, a four-room wooden cabin that once served as slave quarters, with plank floors, gas lanterns, and water Henrietta hauled up a long hill from the creek. The home-house stood on a hillside where wind whipped through cracks in the walls. The air inside stayed so cool that when relatives died, the family kept their corpses in the front hallway for days so people could visit and pay respects. Then they buried them in the cemetery out back.

Henrietta's grandfather was already raising another grandchild that one of his daughters left behind after delivering him on the home-house floor. That child's name was David Lacks, but everyone called him Day, because in the Lacks country drawl, *house* sounds like *hyse*, and *David* sounds like *Day*. No one could have guessed Henrietta would spend the rest of her life with Day—first as a cousin growing up in their grandfather's home, then as his wife.

Like most young Lackses, Day didn't finish school: He stopped in the fourth grade because the family needed him to work the tobacco fields. But Henrietta stayed until the sixth grade. During the school year, after taking care of the garden and livestock each morning, she'd walk two miles—past the white school where children threw rocks and taunted her—to the colored school, a three-room wooden farmhouse hidden under tall shade trees.

At nightfall the Lacks cousins built fires with pieces of old shoes to keep the mosquitoes away, and watched the stars from beneath the big oak tree where they'd hung a rope to swing from. They played tag, ring-around-the-rosy, and hopscotch, and danced around the field singing until Grandpa Tommy yelled for everyone to go to bed.

Henrietta and Day had been sharing a bedroom since she was 4 and he was 9, so what happened next didn't surprise anyone: They started having children together. Their son Lawrence was born just months after Henrietta's 14th birthday; his sister, Lucile Elsie Pleasant, came along four years later. They were both born on the floor of the home-house like their father, grandmother, and grandfather before them. People wouldn't use words like *epilepsy*, *mental retardation*, or *neurosyphilis* to describe Elsie's condition until years later. To the folks in Clover, she was just simple. Touched.

Henrietta and Day married alone at their preacher's house on April 10, 1941. She was 20; he was 25. They didn't go on a honeymoon because there was too much work to do, and no money for travel. Henrietta and Day were lucky if they sold enough tobacco each season to feed the family and plant the next crop. So after their wedding, Day went back to gripping the splintered ends of his old wooden plow as Henrietta followed close behind, pushing a homemade wheelbarrow and dropping tobacco seedlings into holes in the freshly turned red dirt.

A few months later, Day moved north to Turner Station, a small black community outside Baltimore where he'd gotten a job working in a shipyard. Henrietta stayed behind to care for the children and the tobacco until Day made enough money for a house and three tickets north. Soon, with a child on each side, Henrietta boarded a coal-fueled train from the small wooden depot at the end of Clover's Main Street. She left the tobacco fields of her youth and the hundred-year-old oak tree that shaded her from the sun on so many hot afternoons. At the age of 21, she stared through the train window at rolling hills and wide-open bodies of water for the first time, heading toward a new life.

After her visit to Hopkins, Henrietta went back to her usual routine, cleaning and cooking for her husband, their children, and the many cousins she fed each day. Less than a week later, Jones got her biopsy results from the pathology lab: "epidermoid carcinoma of the cervix, Stage I." Translation: cervical cancer.

Cervical carcinomas are divided into two types: invasive carcinomas, which have penetrated the surface of the cervix, and noninvasive carcinomas, which haven't. The noninvasive type is sometimes called "sugar-icing carcinoma," because it grows in a smooth layered sheet across the surface of the cervix, but its official name is carcinoma in situ, which derives from the Latin for "cancer in its original place."

In 1951 most doctors in the field believed that invasive carcinoma was deadly, and carcinoma in situ wasn't. So they hardly treated it. But Richard Wesley TeLinde, head of gynecology at Hopkins and one of the top cervical cancer experts in the country, disagreed—he believed carcinoma in situ was simply an early stage of invasive carcinoma that, left untreated, eventually became deadly. So he treated it aggressively, often removing the cervix, uterus, and most of the vagina. He argued that this would drastically reduce cervical cancer deaths, but his critics called it extreme and unnecessary.

TeLinde thought that if he could find a way to grow living samples from normal cervical tissue and both types of cancerous tissue—something never done before—he could compare all three. If he could prove that carcinoma in situ and invasive carcinoma looked and behaved similarly in the laboratory, he could end the debate, showing that he'd been right all along, and doctors who ignored him were killing their patients. So he called George Gey (pronounced "guy"), head of tissue culture research at Hopkins.

Gey and his wife, Margaret, had spent the last three decades working to grow malignant cells outside the body, hoping to use them to find cancer's cause and cure. But most of the cells died quickly, and the few that survived hardly grew at all. The Geys were determined to grow the first immortal human cells: a continuously dividing line of cells all descended from one original sample, cells that would constantly replenish themselves and never die. They didn't care what kind of tissue they used, as long as it came from a person.

So when TeLinde offered Gey a supply of cervical cancer tissue in exchange for trying to grow some cells, Gey didn't hesitate. And TeLinde began collecting samples from any woman who happened to walk into Hopkins with cervical cancer. Including Henrietta.

Jones called Henrietta on February 5, 1951, after getting her biopsy report back from the lab, and told her the tumor was malignant. Henrietta didn't tell anyone what Jones said, and no one asked. She simply went on with her day as if nothing had happened, which was just like her—no sense upsetting anyone over something she could just deal with herself.

The next morning Henrietta climbed from the Buick outside Hopkins again, telling Day and the children not to worry.

"Ain't nothin' serious wrong," she said. "Doctor's gonna fix me right up."

Henrietta went straight to the admissions desk and told the receptionist she was there for her treatment. Then she signed a form with the words operation permit at the top of the page. It said:

I hereby give consent to the staff of The Johns Hopkins Hospital to perform any operative procedures and under any anaesthetic either local or general that they may deem necessary in the proper surgical care and treatment of:

Henrietta printed her name in the blank space. A witness with illegible handwriting signed a line at the bottom of the form, and Henrietta signed another.

Then she followed a nurse down a long hallway into the ward for colored women, where Howard Jones and several other white physicians ran more tests than she'd had in her entire life. They checked her urine, her blood, her lungs. They stuck tubes in her bladder and nose.

Henrietta's tumor was the invasive type, and like hospitals nationwide, Hopkins treated all invasive cervical carcinomas with radium, a white radioactive metal that glows an eerie blue. So the morning of Henrietta's first treatment, a taxi driver picked up a doctor's bag filled with thin glass tubes of radium from a clinic across town. The tubes were tucked into individual slots inside small canvas pouches hand-sewn by a local Baltimore woman. One nurse placed the pouches on a stainless steel tray. Another wheeled Henrietta into the small colored-only operating room, with stainless steel tables, huge glaring lights, and an all-white medical staff dressed in white gowns, hats, masks, and gloves.

With Henrietta unconscious on the operating table in the center of the room, her feet in stirrups, the surgeon on duty, Lawrence Wharton Jr., sat on a stool between her legs. He peered inside Henrietta, dilated her cervix, and prepared to treat her tumor. But first—though no one had told Henrietta that TeLinde was collecting samples or asked if she wanted to be a donor—Wharton picked up a sharp knife and shaved two dime-size pieces of tissue from Henrietta's cervix: one from her tumor, and one from the healthy cervical tissue nearby. Then he placed the samples in a glass dish.

Wharton slipped a tube filled with radium inside Henrietta's cervix, and sewed it in place. He then sewed a pouch filled with radium to the outer surface of her cervix and packed another against it. He slid several rolls of gauze inside her vagina to help keep the radium in place, then threaded a catheter into her bladder so she could urinate without disturbing the treatment.

When Wharton finished, a nurse wheeled Henrietta back into the ward, and a resident took the dish with the samples to Gey's lab, as he'd done many times before. Gey still got excited at moments like this, but everyone else in his lab saw Henrietta's sample as something tedious—the latest of what felt like countless samples that scientists and lab technicians had been trying and failing to grow for years.

Gey's 21-year-old assistant, Mary Kubicek, sat eating a tuna salad sandwich at a long stone culture bench that doubled as a break table. She and Margaret and the other women in the Gey lab spent many hours there, all in nearly identical cat's-eye glasses with fat dark frames and thick lenses, their hair pulled back in tight buns.

"I'm putting a new sample in your cubicle," Gey told Mary.

She pretended not to notice. "Not again," she thought, and kept eating her sandwich. Mary knew she shouldn't wait—every moment those cells sat in the dish made it more likely they'd die. But they always died anyway. "Why bother?" she thought.

At that point, there were many obstacles to growing cells successfully. For starters, no one knew exactly what nutrients they needed to survive or how best to supply them. But the biggest problem facing cell culture was contamination. Bacteria and a host of other microorganisms could find their way into cultures—from people's unwashed hands, their breath, and dust particles floating through the air—and destroy them. Margaret Gey had been trained as a surgical nurse, which meant sterility was her specialty—it was key to preventing deadly

infections in patients in the operating room.

Margaret patrolled the lab, arms crossed, leaning over technicians' shoulders as they worked, inspecting glassware for spots or smudges. Mary followed Margaret's sterilizing rules meticulously to avoid her wrath. Only then did she pick up the pieces of Henrietta's cervix—forceps in one hand, scalpel in the other—and carefully slice them into one-millimeter squares. She sucked each square into a pipette, and dropped them one at a time onto chicken-blood clots she'd placed at the bottom of dozens of test tubes. She covered each clot with several drops of culture medium, plugged the tubes with rubber stoppers, and wrote "HeLa," for Henrietta and Lacks, in big black letters on the side of each tube. Then she put them in an incubator.

For the next few days, Mary started each morning with her usual sterilization drill. She'd peer into all the incubating tubes, laughing to herself and thinking, "Nothing's happening." "Big surprise." Then she saw what looked like little rings of fried egg white around the clots at the bottom of each tube. The cells were growing, but Mary didn't think much of it—other cells had survived for a while in the lab.

But Henrietta's cells weren't merely surviving—they were growing with mythological intensity. By the next morning, they'd doubled. Mary divided the contents of each tube in two, giving them room to grow, and soon she was dividing them into four tubes, then six. Henrietta's cells grew to fill as much space as Mary gave them.

Still, Gey wasn't ready to celebrate. "The cells could die any minute," he told Mary. But they didn't. The cells kept growing like nothing anyone had seen, doubling their numbers every 24 hours, accumulating by the millions. "Spreading like crabgrass!" Margaret said. As long as they had food and warmth, Henrietta's cancer cells seemed unstoppable.

Soon, George told a few of his closest colleagues that he thought his lab might have grown the first immortal human cells.

To which they replied, Can I have some? And George said yes.

George Gey sent Henrietta's cells to any scientist who wanted them for cancer research. HeLa cells rode into the mountains of Chile in the saddlebags of pack mules and flew around the country in the breast pockets of researchers until they were growing in laboratories in Texas, Amsterdam, India, and many places in between. The Tuskegee Institute set up facilities to mass-produce Henrietta's cells, and began shipping 20,000 tubes of HeLa—about six trillion cells—every week. And soon, a multibillion-dollar industry selling human biological materials was born.

HeLa cells allowed researchers to perform experiments that would have been impossible with a living human. Scientists exposed them to toxins, radiation, and infections. They bombarded them with drugs, hoping to find one that would kill malignant cells without destroying normal ones. They studied immune suppression and cancer growth by injecting HeLa into rats with weak immune systems, who developed malignant tumors much like Henrietta's. And if the cells died in the process, it didn't matter—scientists could just go back to their eternally growing HeLa stock and start over again.

But those cells grew as powerfully in Henrietta's body as they did in the lab: Within months of her diagnosis, tumors had taken over almost every organ in her body. Henrietta died on October 4, 1951, leaving five children behind, knowing nothing about her cells growing in laboratories around the world.

Henrietta's husband and children wouldn't find out about those cells until 25 years later, when researchers from Johns Hopkins decided to track down Henrietta's family to do research on them to learn more about HeLa.

When Henrietta's children learned of HeLa, they were consumed with questions: Had scientists killed their mother to harvest her cells? Were clones of their mother walking the streets of cities around the world? And if Henrietta was so vital to medicine, why couldn't they afford health insurance? Today, in Baltimore, her family still wrestles with feelings of betrayal and fear, but also pride. As her daughter Deborah once whispered to a vial of her mother's cells: "You're famous, just nobody knows it."

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